



SCM
053 0531

J.R. Simplot Company
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May 17, 2017

Arthur Burbank
Remedial Project Manager
Forest Service Intermountain Region
4350 South Cliffs Drive
Pocatello, ID 83204

**Subject: Smoky Canyon Mine Remedial Investigation/Feasibility Study
Final Phase 2 Pilot Study Work Plan/Sampling and Analysis Plan
Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal
Fluidized Bed Bioreactor Treatment Technology**

Pilot Test Plan: Activated Sludge Seeding Request

Dear Art:

Attached are Simplot's response to address Agency comments (May 10, 2017) on the *Activated Sludge Seeding request dated April 10, 2017*. Based on the comments provided by the agencies on May 10, 2017, we have adjusted the approach to the seeding in order to expedite approval and get the system operational as soon as possible. The new approach includes using a commercially available seeding stock that has the appropriate Safety Data Sheets (SDS). The SDS and analytical results of the proposed seeding products are attached.

Please contact me if you have any questions.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

Enclosures

USEPA SF



1561437

cc

Arthur Burbank – USFS, 410 East Hooper, Soda Springs, ID 83276 (unbound)
Sherri Stumbo – USFS, 4350 South Cliffs Dr., Pocatello, ID 83204
Rick McCormick – CH2M, email only
Jeff Osterman – CH2M, email only
Doug Scott – CH2M, email only
Wayne Crowther – IDEQ, email only
Kathryn Venable – IDEQ, email only
Brady Johnson – IDEQ, email only
Colleen O'Hara-Epperly – BLM, email only
Sandi Fisher – USFWS, email only
Jeremy Moore – USFWS, 4425 Burley Dr., Suite A, Chubbuck, ID 83202
Matt Wilkening – USEPA, email only
Kelly Wright – Shoshone-Bannock Tribes, P.O. Box 306, Fort Hall, ID 83203
Susan Hanson – (b) (6), Pocatello, ID 83202
Gary Billman – IDL, email only
Alan Prouty – J.R. Simplot Company, email only
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Dedra Williams – J.R. Simplot Company, email only
Jon Witt – J.R. Simplot Company, 999 Main St., Suite 1300, Boise ID 83707
Lori Hamann – J.R. Simplot Company, email only
Chad Gentry – J.R. Simplot Company, email only
Ron Quinn – J.R. Simplot Company, 1890 Smoky Canyon Mine Road, Afton, WY 83110
Del Cunningham – J.R. Simplot Company, email only
Fred Charles – Formation Environmental, email only

Agencies Comments – Smoky Canyon Mine RI/FS Phase II Treatment System Pilot Study Activated Sludge Seeding Request

General Comments:

GC-1 *While the microorganisms may be naturally occurring bacteria, protozoa and metazoa, they are not necessarily naturally occurring to the environment at Hoopes Springs and may result in unintended consequences.*

Response: Agreed, all unintended consequences cannot be known and a cautious approach to plant seeding is required. A commercially available seed culture with known microbial populations is to be provided in lieu of the biomass from the JR Simplot Caldwell Facility. Product information and SDS sheets are provided with this response to comments.

GC-2 *Using activated sludge biomass from an existing treatment system to seed a new system at startup is a standard approach. As long as the Caldwell treatment system receives no domestic wastewater, as indicated in the J4 letter, no concerns related to human health (pathogens) would be expected from the proposed transfer of activated sludge biomass. Similarly, no adverse effects on the environment would be expected as long as the Hoopes Spring activated sludge system is designed and operated well and discharge of high concentrations of solids with the effluent is avoided. Please clarify.*

Response: The treatment system is designed to minimize the amount of biomass that may be discharged. Plant operations are designed to discharge within the design limits for total suspended solids of 5 mg/L.

GC-3 *The J4 letter states that activated sludge will be obtained from the aeration basins at the Caldwell plant and trucked to the Hoopes treatability study. Please clarify what type of biological treatment system exists at the Caldwell plant (e.g., true activated sludge with a secondary clarifier and sludge recycle, or a once-through aerated lagoon system)?*

Response: No longer applicable due to use of commercially available seeding stock.

It is typically more cost-effective to transport concentrated sludge (i.e., waste activated sludge [WAS] from clarifier underflow) than more dilute mixed liquor from the aeration basins. If this is possible, it allows one to transfer an equal amount of active biomass in a fraction of the volume.

Response: No longer applicable due to use of commercially available concentrated seeding stock.

GC-4 *The J4 letter states that 4,000-6,000 gallons of activated sludge will be transferred to the Hoopes Spring system for seeding. Please clarify the total volume of the Hoopes aeration basin(s) to determine what proportion of the total volume is represented by the proposed seed volume?*

Response: Total activated sludge system volume is 280,000 gallons.

It is not necessary to fill, or nearly fill, a new aeration basin with seed sludge at startup. The microbial community of the seed sludge will "acclimate" to the new influent feed – that is, individual bacterial populations will either grow or die off depending on their ability to use and compete for the "food" in the new influent (which will differ from that at the potato plant).

Response: The treatment system will not be filled with biomass and a 2 to 4-week acclimation period is planned prior to plant operations.

GC-5 *One would expect that the FBR effluent to be treated in the new activated sludge polishing process will be rather dilute with respect to bio-oxidizable organics (e.g., BOD5) and nutrients. If not, it would suggest that the organic substrate and inorganic nutrients fed to the FBR were not*

well-optimized and were being overdosed. Very dilute influents, if not carefully considered in the process design, can lead to poor sludge settle-ability, solids carryover from the clarifier with the effluent, and, potentially, solids washout leading to process failure. Perhaps that is why sand filters are included, as indicated in the J4 report, to capture carryover solids. This treatment application might be suitable to a fixed film or a hybrid fixed film/suspended growth system. Were these considered when selecting the activated sludge polishing process?

Response: Yes, fixed film trickling filters and moving bed bioreactors were considered. An activated sludge system provides maximum process control as opposed to a passive flow through treatment system. Supplemental organic substrate will be provided to the activated sludge system to maintain a viable biomass which does not wash out.

GC-6 *The activated sludge seed stock for the Hoopes Springs Pilot Plant is indicated to be harvested from the J.R. Simplot Idaho Plant which processes potatoes. The reviewer is concerned that the sludge micro-fauna from this system may not be appropriate for a seed stock for this system. It is suggested that feed stock be obtained from the sludge disposal tank of the existing system or similar selenium treatment facility, with an appropriate mixed liquor suspended solids (MLSS) concentration at anticipated operational capacity at start up.*

Response: No sludge is available from the existing FBR backwashes. To our knowledge, no similar activated sludge systems operating behind an anaerobic selenium treatment facility exist.

Specific Comments:

SC-1 *Provide the MLSS concentration of the activated sludge that will be harvested for seed stock.*

Response: No longer applicable due to use of commercially available seeding stock.

SC-2 *With the proposed feed stock being obtained from potato processing, provide the ratio of nitrifying bacteria (Nitrosomonas/Nitrobacter/ECT) vs. non-nitrifying bacteria for both the seed stock and the current system. There is concern that differing values of the nitrogen levels between feed waters could result in die-off of the seed stock if it contains higher concentration of nitrifying bacteria.*

Response: The commercial seed cultures will include nitrifying populations, as the Hoopes TSP activated sludge treatment system is designed to nitrify and a healthy population of nitrifiers is preferable. An acclimation period of 3-4 weeks to continue to grow biomass and increase the nitrifying population is planned.

SC-3 *A differentiation analysis between the seed stock taxa should be completed. The taxa available should be compatible with the anticipated flows and water conditions expected at the Hoopes facility and not contain filament producing species or species pathogenic to either the desired microfauna population or to human or animal health.*

Response: The commercial seed product information provided results showing that is not pathogenic. See attached information.

SC-4 *In the March 2017 Phase 2 Pilot Study Work Plan, Section 5.0 discusses that Frontier will be responsible for the selection of the microbial combination for the system. What recommendations has Frontier provided as to the use of seed stock from an operational activated sludge systems processing mine impacted water?*

Response: Frontier Water Systems selects the FBR seed culture, but do not have responsibility for the seeding of the activated sludge system.

SC -5 *Please describe the method that the new seed stock will be transported to insure viability and how it will be introduced into the system.*

Response: The products are freeze dried and concentrated liquids and will be added directly to the top of the aeration tank.

SC-6 *What are all the bacterial populations of the biomass? Will these populations enter the ecological system surrounding Hoopes springs?*

Response: The commercial seed product lists the bacterial populations of the biomass. See the attached information.

SC-7 *The request references higher lifeforms in the protozoa and metazoa sub-kingdoms serving as good indicator organisms for treatment system health during routine monitoring. What lifeforms are these and what exactly will they represent?*

Response: The commercial seed product will not include these higher lifeforms, but they are anticipated to be present within Hoopes Springs and will grow naturally within the system.

The lifeforms include: stalked ciliates, flagellated ciliates, tardigrade, amoeba, rotifers, and

many others. The relative predominance of certain higher lifeforms are indicative of the type of environment present within the activated sludge system, i.e. dissolved oxygen concentration, sulfide concentration, sludge age, F:M ratio, etc.



EnvironmentalLeverage.com

812 Dogwood Drive, Suite A

North Aurora, IL 60542

SAFETY DATA SHEET
MicroClear® M100
Micronutrient Product

SECTION I - IDENTIFICATION

Trade Name: MicroClear® M100
Chemical Family: Sea Plant Extract
Common use: Wastewater applications, Remediation
Supplied by: Environmental Leverage® Inc.
812 Dogwood Dr. Suite A, North Aurora, IL 60542
Phone: 630-906-9791 Fax: 630-906-9792
www.EnvironmentalLeverage.com
Emergency Phone: 630-906-9791 8am-5pm CST

SECTION II - HAZARDOUS / IDENTITY INFORMATION

Non-hazardous. Organic chemicals to enhance biological activity, Sea Plant Extract

HAZARDOUS COMPONENTS

Ingredients not precisely identified are proprietary or non-hazardous. N/K=None Known
GHS Classification - Not Classified

SECTION III - COMPOSITION

Boiling Point	N/A	Specific Gravity (H ₂ O= 1)	N/A
Vapor Pressure (mm H/g)	N/A	Melting Point	N/A
Vapor Density (Air= 1)	N/A	Evaporation Rate (Butyl Acetate= 1)	N/A
Solubility in Water: Moderate-disperses in water			
Appearance and Odor: powder – gray or dark green in color - earthy, slight marine odor			

SECTION IV – FIRST AID

EMERGENCY AND FIRST AID PROCEDURES:

Swallowing: Get medical attention if allergic symptoms develop (observe for 48 hours). Never give anything by mouth to an unconscious or convulsing person. Get medical attention. May lead to nausea or diarrhea. Give two glasses water to dilute product. Do not induce vomiting. Contact Physician.

Recommended Precautions: Store in safe place. Wear approved respiratory protection.

Skin: Wash exposed areas with soap and water. Get medical attention if allergic reaction occurs.

Recommended Precautions: Wash material off skin with plenty of soap and water. Wash clothing and footwear before reuse.

Inhalation: Remove patient to fresh air. If breathing is difficult or allergic reaction or irritation develops, administer Oxygen and get medical attention. Asthmatic type response with sensitive individuals may occur. Remove individual to fresh air. Contact Physician

Recommended Precautions: Use approved respiratory protection. Always wash hands thoroughly after use.

Eyes: In case of contact, flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Get medical attention if eye irritation occurs.

NOTES TO PHYSICIANS: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION V – FIRE FIGHTING MEASURES

Flash Point (Method Used)	N/A	Flammable Limits	N/A	LEL	UEL-N/A
Extinguishing Media:	Water and Foam Are Suitable				
Special Fire Fighting Procedures:	No Special Firefighting Equipment is needed, however, self-contained breathing apparatus and protective clothing should be worn in fighting fires involving chemicals.				
Unusual Fire and Explosion Hazards:	N/A				

SECTION VI – ACCIDENTAL RELEASE MEASURES

Steps to be taken if Material is Released or Spilled: All personnel involved in the cleanup may wear protective clothing. NO emergency results from spillage. However, spills should be cleaned up promptly. To the extent possible, clean up spills using shovels. Sweep or vacuum spilled material, being careful not to create dust. Wear approved respirator during cleanup. For small spills, flush to waste treatment sewer (product is biodegradable). For large spills, contain and collect for reuse.

SECTION VII – HANDLING AND STORAGE

CAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store In Cool, Dry, Safe Place. Keep container closed. Keep away from moisture while storing. Wear Respiratory Protection if needed. Always Wash Hands Thoroughly After Use. Wear Approved Goggles When Handling Product.

OTHER PRECAUTIONS

Keep Out Of Reach Of Children.

SECTION VIII – EXPOSURE CONTROLS /PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name(s):	ACGIH (TWA)	OSHA (TWA)
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NONE

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals,

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (Sea Kelp) in some people.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance.....Dark Green	Fragrance.....mild-earthy, marine	Form.....powder
pH.....6.5-7.5	Shelf-Life..... 2 years/u.o.c.	Flash Point.....none
Odor Threshold	Not Available	
Decomposition Temperature	Not Applicable	
Boiling Point/range	Not Applicable	
Melting Point/range	Not Applicable	
Flammability	Not flammable under normal conditions of storage and handling.	
Auto ignition temperature	Not Applicable	

Explosive limits	Not Applicable
Oxidizing Properties	None
Vapor Pressure	Not Applicable
Relative density	0.6 to 0.8
Solubility in water	Disperses in water.
Solubility in solvent	Not soluble
Partition coefficient	Not Applicable
Viscosity	Not Applicable
Vapor density	Not Applicable
Evaporation rate	Not Applicable
Conductivity	Not Applicable

SECTION X – STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of use. Avoid excessive heat
Conditions to avoid:	None.
Incompatibility (Materials to avoid):	None
Hazardous Decomposition or Byproducts:	None
Hazardous Polymerization:	Will NOT occur

SECTION XI – TOXICOLOGICAL INFORMATION

EXPOSURE LIMITS

Chemical Name(s):	ACGIH (TWA)	OSHA (TWA)
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NONE

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals,

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (Sea kelp) in some people.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen. No known significant effects or critical hazards.

SECTION XII – ECOLOGICAL INFORMATION

Environmental Effects: Minimal impact under normal conditions of use and storage.

This naturally occurring formulation consists of micronutrients, trace minerals and vitamins.

The product contains naturally occurring materials.

Mobility: Disperses in water

Degradability: Contents are biodegradable

Bioaccumulative potential: None known

Aquatic Toxicity: None Known

SECTION XIII – DISPOSAL INFORMATION

Waste disposal method: No special disposal method. May be sewered; compatible with all known biological treatment methods. Dispose of in accordance with local, state, and Federal regulations.

Precautions to be taken in Handling and Storing: No special precautions required while handling product. Keep dry due to water soluble packaging. Avoid direct skin contact.

SECTION XIV – TRANSPORT INFORMATION

D.O.T. Hazard Class: Not Applicable
D.O.T. Label(s): Not Applicable
D.O.T. Shipping Name: (N.O.I) Non Hazardous
UN number- Not Classified
Class- Not Classified
Primary Hazard-- Not Classified
Subsidiary Hazard-- Not Classified
Packing Group - Not Classified
Emergency Action Code - Not Classified
H.I. Number - Not Classified
Marine Pollutant-- Not Classified
Transport Environmental Hazard- Not Classified
Transport Special Precautions – Not Classified (Do not Freeze)
Proper Shipping name
Water treatment compounds, bacterial culture.

SECTION XV – REGULATORY INFORMATION

TSCA Inventory Status: This product is exempt from on the TSCA inventory.
Transportation Status: DOT: Not regulated.
Reportable Quantity (RQ) under 49 CFR 172. 101 Appendix: Not required.
SARA Title III:
Section 302/304/311/312 Extremely Hazardous Substance List: Not listed.
Section 313 Toxic Chemicals: Not listed.
Reportable Quantity (RQ) under US EPA CERCLA: Not required.
RCRA Hazardous Waste: Not listed.
California Proposition 65: Not listed.

SECTION XVI– OTHER INFORMATION

Product Name: MicroClear® M100

C.A.S. #

N/A

Supersedes: All previous

Effective Date: 1/2014

National Fire Protection Association
Hazardous Materials Identification System
4=Extreme/Severe 3=High/Serious
2=Moderate 1=Slight 0=Minimum

	NFPA	HMIS
Health	0	0
Fire	0	0
Reactivity	0	0
Special	0	0

THE DATA AND RECOMMENDATIONS PRESENTED HEREIN ARE BASED UPON RESEARCH OF OTHERS AND ARE BELIEVED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THIS DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. THE MANUFACTURER ASSUMES NO RESPONSIBILITY FOR THE INJURY TO CUSTOMERS OR THIRD PERSONS PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT ADHERED TO AS STIPULATED IN THE DATA SHEET. ADDITIONALLY, ACTUAL USE BY OTHERS IS BEYOND OUR CONTROL, NO GUARANTEE, EXPRESSED OR IMPLIED, IS MADE BY THE MANUFACTURER AS TO THE EFFECT OF SUCH USE, THE RESULTS TO BE OBTAINED OR THE SAFETY AND TOXICITY OF THE PRODUCT NOR DOES THE MANUFACTURER ASSUME ANY LIABILITY ARISING OUT OF USE, MISUSE, BY OTHERS, OF THE PRODUCT HEREIN. INFORMATION PROVIDED HEREIN IS PROVIDED SOLELY FOR THE CUSTOMERS ASSISTANCE IN COMPLYING WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND REGULATIONS THEREUNDER. ANY OTHER USE IS PROHIBITED.

MATERIAL SAFETY DATA SHEET MicroClear® M100





Certificate of Analysis

Product MicroClear M100

Shipment Date April 2017

Lot Number BC9-16

Producer Environmental Leverage Inc.

This product is a naturally occurring micronutrient. There are no hazardous materials present.

We certify the above given information to be correct at the time of sampling.



Environmental Leverage Inc.
812 Dogwood Drive Suite A
North Aurora, IL 60542
www.EnvironmentalLeverage.com
elfenvironmental@aol.com



EnvironmentalLeverage.com

812 Dogwood Drive, Suite A
North Aurora, IL 60542

SAFETY DATA SHEET
MicroClear® 201
Bioaugmentation Product

SECTION I - IDENTIFICATION

Trade Name: MicroClear® 201
Chemical Family: Bacterial Mixture
Common use: Wastewater applications, Remediation
Supplied by: Environmental Leverage® Inc.
812 Dogwood Dr. Suite A, North Aurora, IL 60542
Phone: 630-906-9791 Fax: 630-906-9792
www.EnvironmentalLeverage.com
Emergency Phone: 630-906-9791 8am-5pm CST

SECTION II - HAZARDOUS / IDENTITY INFORMATION

Non-hazardous. Bacterial Cultures/Enzymes. Product formulation consists of a range of naturally occurring microorganisms which are known to be non-pathogenic to humans, livestock, and agricultural crops.

HAZARDOUS COMPONENTS

Ingredients not precisely identified are proprietary or non-hazardous. N/K=None Known
GHS Classification- Not Classified

SECTION III - COMPOSITION

Boiling Point	N/A	Specific Gravity (H ₂ O= 1)	N/A
Vapor Pressure (mm H/g)	N/A	Melting Point	N/A
Vapor Density (Air= 1)	N/A	Evaporation Rate (Butyl Acetate= 1)	N/A
Solubility in Water: Moderate-disperses in water			
Appearance and Odor: powder – straw in color - musty			

SECTION IV – FIRST AID

EMERGENCY AND FIRST AID PROCEDURES:

Swallowing: Get medical attention if allergic symptoms develop (observe for 48 hours). Never give anything by mouth to an unconscious or convulsing person. Get medical attention. May lead to nausea or diarrhea. Give two glasses water to dilute product. Do not induce vomiting. Contact Physician.

Recommended Precautions: Store in safe place. Wear approved respiratory protection.

Skin: Wash exposed areas with soap and water. Get medical attention if allergic reaction occurs.

Recommended Precautions: Wash material off skin with plenty of soap and water. Wash clothing and footwear before reuse.

Inhalation: Remove patient to fresh air. If breathing is difficult or allergic reaction or irritation develops, administer Oxygen and get medical attention. . Asthmatic type response with sensitive individuals may occur. Remove individual to fresh air. Contact Physician

Recommended Precautions: Use approved respiratory protection. Always wash hands thoroughly after use.

Eyes: In case of contact, flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Get medical attention if eye irritation occurs.

NOTES TO PHYSICIANS: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION V – FIRE FIGHTING MEASURES

Flash Point (Method Used)	N/A	Flammable Limits	N/A	LEL	UEL-N/A
Extinguishing Media:	Water and Foam Are Suitable				
Special Fire Fighting Procedures:	No Special Firefighting Equipment is needed, however, self-contained breathing apparatus and protective clothing should be worn in fighting fires involving chemicals.				
Unusual Fire and Explosion Hazards:	N/A				

SECTION VI – ACCIDENTAL RELEASE MEASURES

Steps to be taken if Material is Released or Spilled: All personnel involved in the cleanup may wear protective clothing. NO emergency results from spillage. However, spills should be cleaned up promptly. To the extent possible, clean up spills using shovels. Sweep or vacuum spilled material, being careful not to create dust. Wear approved respirator during cleanup. For small spills, flush to waste treatment sewer (product is biodegradable). For large spills, contain and collect for reuse.

Environmental Precautions: The bacteria and carriers are naturally occurring and should not pose an environmental risk.

SECTION VII – HANDLING AND STORAGE

CAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store In Safe Place. Wear Respiratory Protection if needed. Always Wash Hands Thoroughly After Use. Wear Approved Goggles When Handling Product. Provide adequate general ventilation.

OTHER PRECAUTIONS

Keep Out Of Reach Of Children.

SECTION VIII – EXPOSURE CONTROLS /PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name(s):	ACGIH (TWA)	OSHA (TWA)
NONE		

Exposure standards:

Component LTEL (8h TWA) STEL (15 mins)

None

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin. Wash hands after use.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals,

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (hay fever, asthma) in some people. Individuals hyper allergic to enzymes or other related proteins should not handle.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance.....light tan	Fragrance.....mild-earthly	Form.....powder
pH.....6.8-8.5	Shelf-Life..... 2 years/u.o.c.	Flash Point.....none
Odor Threshold	Not Available	
Decomposition Temperature	Not Applicable	
Boiling Point/range	Not Applicable	

Melting Point/range	Not Applicable
Flammability	Not flammable under normal conditions of storage and handling.
Auto ignition temperature	Not Applicable
Explosive limits	Not Applicable
Oxidizing Properties	None
Vapor Pressure	Not Applicable
Relative density	0.6 to 0.8
Solubility in water	Disperses in water.
Solubility in solvent	Not soluble
Partition coefficient	Not Applicable
Viscosity	Not Applicable
Vapor density	Not Applicable
Evaporation rate	Not Applicable
Conductivity	Not Applicable

SECTION X – STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of use. Avoid excessive heat
Conditions to avoid:	None.
Incompatibility (Materials to avoid):	Strong Acids May Inactivate Cultures
Hazardous Decomposition or Byproducts:	Oxides of Carbon & Nitrogen.
Hazardous Polymerization:	Will NOT occur

SECTION XI – TOXICOLOGICAL INFORMATION

EXPOSURE LIMITS

Chemical Name(s):	ACGIH (TWA)	OSHA (TWA)
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NONE

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals.

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (hay fever, asthma) in some people. Individuals hyper allergic to enzymes or other related proteins should not handle.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen. No known significant effects or critical hazards.

SECTION XII – ECOLOGICAL INFORMATION

Environmental Effects: Minimal impact under normal conditions of use and storage. The bacterial cultures are naturally occurring organisms. The product contains naturally occurring materials.

Mobility: Disperses in water

Degradability: Contents are biodegradable

Bioaccumulative potential: None known

Aquatic Toxicity: None Known

SECTION XIII – DISPOSAL INFORMATION

Waste disposal method: No special disposal method. May be sewerred; compatible with all known biological treatment methods. Dispose of in accordance with local, state, and Federal regulations.

Precautions to be taken in Handling and Storing: No special precautions required while handling product. Keep dry due to water soluble packaging. Avoid direct skin contact.

SECTION XIV – TRANSPORT INFORMATION

D.O.T. Hazard Class: Not Applicable
D.O.T. Label(s): Not Applicable
D.O.T. Shipping Name: (N.O.I) Non Hazardous

UN number- Not Classified
Class- Not Classified
Primary Hazard-- Not Classified
Subsidiary Hazard-- Not Classified
Packing Group - Not Classified
Emergency Action Code - Not Classified
H.I. Number - Not Classified
Marine Pollutant-- Not Classified
Transport Environmental Hazard- Not Classified
Transport Special Precautions – Not Classified (Do not Freeze)
Proper Shipping name
Water treatment compounds, bacterial culture.

SECTION XV – REGULATORY INFORMATION

TSCA Inventory Status: This product is exempt from on the TSCA inventory.
Transportation Status: DOT: Not regulated.
Reportable Quantity (RQ) under 49 CFR 172. 101 Appendix: Not required.
SARA Title III:
Section 302/304/311/312 Extremely Hazardous Substance List: Not listed.
Section 313 Toxic Chemicals: Not listed.
Reportable Quantity (RQ) under US EPA CERCLA: Not required.
RCRA Hazardous Waste: Not listed.
California Proposition 65: Not listed.

SECTION XVI– OTHER INFORMATION

Product Name: MicroClear® 201
Supersedes: All previous

C.A.S. #

N/A

Effective Date: 1/2014

National Fire Protection Association
Hazardous Materials Identification System
4=Extreme/Severe 3=High/Serious
2=Moderate 1=Slight 0=Minimum

	NFPA	HMIS
Health	0	0
Fire	0	0
Reactivity	0	0
Special	0	0

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MATERIAL SAFETY DATA SHEET MicroClear® 201



Certificate of Analysis

Product	<u>MicroClear®201</u>
Shipment Date	<u>January 26, 2017</u>
Lot Number	<u>1601501</u>
Producer	<u>Environmental Leverage Inc.®</u>
Bacterial Concentration	<u>>1e9 (1 billion) CFU/g</u>
Contamination/Pathogens	<u>None detected</u>
Analytical methods	<u>Dry Product Plate Count Procedure</u>

The product contains Class 1 strains of *Bacillus*. These strains are Generally Regarded As Safe (GRAS).

We certify the above given information to be correct at the time of sampling.



Environmental Leverage Inc.®
812 Dogwood Drive Suite A
North Aurora, IL 60542
www.EnvironmentalLeverage.com
Elfenvironmental@aol.com



EnvironmentalLeverage.com

812 Dogwood Drive, Suite A

North Aurora, IL 60542

SAFETY DATA SHEET
MicroSolv™ 600-L
Bioaugmentation Product

SECTION I - IDENTIFICATION

Trade Name: MicroSolv™ 600-L
Chemical Family: Bacterial Mixture Liquid
Common use: Wastewater applications, Remediation
Supplied by: Environmental Leverage® Inc.
812 Dogwood Dr. Suite A, North Aurora, IL 60542
Phone: 630-906-9791 Fax: 630-906-9792
www.EnvironmentalLeverage.com
Emergency Phone: 630-906-9791 8am-5pm CST

SECTION II - HAZARDOUS / IDENTITY INFORMATION

Non-hazardous. Product mixed formulation, naturally occurring non-altered nitrifying microbes, in a liquid concentrate. Which are known to be non-pathogenic to humans, livestock, and agricultural crops.

HAZARDOUS COMPONENTS

Ingredients not precisely identified are proprietary or non-hazardous. N/K=None Known
GHS Classification- Not Classified

SECTION III - COMPOSITION

Boiling Point	N/A	Specific Gravity (H ₂ O= 1)	1.01 +/- .1
Vapor Pressure (mm H/g)	N/A	Melting Point	N/A
Vapor Density (Air= 1)	N/A	Evaporation Rate (Butyl Acetate= 1)	N/A
Solubility in Water: Moderate-disperses in water			
Appearance and Odor: Liquid - Reddish Brown in color - yeasty odor			

SECTION IV – FIRST AID

EMERGENCY AND FIRST AID PROCEDURES:

Swallowing: Get medical attention if allergic symptoms develop (observe for 48 hours). Never give anything by mouth to an unconscious or convulsing person. Get medical attention. May lead to nausea or diarrhea. Give two glasses water to dilute product. Do not induce vomiting. Contact Physician.

Recommended Precautions: Store in safe place and keep container lid closed. Wear approved respiratory protection.

Skin: Wash exposed areas with soap and water. Get medical attention if allergic reaction occurs.

Recommended Precautions: Wash material off skin with plenty of soap and water. Wash clothing and footwear before reuse.

Inhalation: Remove patient to fresh air. If breathing is difficult or allergic reaction or irritation develops, administer Oxygen and get medical attention. . Asthmatic type response with sensitive individuals may occur. Remove individual to fresh air. Contact Physician

Recommended Precautions: Use approved respiratory protection. Always wash hands thoroughly after use.

Eyes: In case of contact, flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Get medical attention if eye irritation occurs.

NOTES TO PHYSICIANS: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION V – FIRE FIGHTING MEASURES

Flash Point (Method Used)	N/A	Flammable Limits	N/A	LEL	UEL-N/A
Extinguishing Media:	Water and Foam Are Suitable				
Special Fire Fighting Procedures:	No Special Firefighting Equipment is needed, however, self-contained breathing apparatus and protective clothing should be worn in fighting fires involving chemicals.				
Unusual Fire and Explosion Hazards:	N/A				

SECTION VI – ACCIDENTAL RELEASE MEASURES

Steps to be taken if Material is Released or Spilled: All personnel involved in the cleanup may wear protective clothing. NO emergency results from spillage. However, spills should be cleaned up promptly. To the extent possible, clean up spills using shovels. Sweep or vacuum spilled material, being careful not to create dust. Wear approved respirator during cleanup. For small spills, flush to waste treatment sewer (product is biodegradable). For large spills, contain and collect for reuse.

Environmental Precautions: The bacteria and carriers are naturally occurring and should not pose an environmental risk.

SECTION VII – HANDLING AND STORAGE

CAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store In Safe Refrigerated Only (Must store at 35°F - 39°F or 2° - 4° C) Place when not in use. Keep container lid closed when not in use. Wear Respiratory Protection if needed. Always Wash Hands Thoroughly After Use. Wear Approved Goggles When Handling Product. Provide adequate general ventilation.

OTHER PRECAUTIONS

Keep Out Of Reach Of Children.

SECTION VIII – EXPOSURE CONTROLS /PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name(s): ACGIH (TWA) OSHA (TWA)

NONE

Exposure standards:

Component LTEL (8h TWA) STEL (15 mins)

None

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin. Wash hands after use.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals,

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (hay fever, asthma) in some people. Individuals hyper allergic to enzymes or other related proteins should not handle.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance.....reddish brown colored liquid	Fragrance.....yeasty	Form.....Liquid
pH.....7.0 +/- .5	Shelf-Life...3 months refrigerated/u.o.c.	Flash Point.....none
Odor Threshold	Not Available	
Decomposition Temperature	Not Applicable	

Boiling Point/range	Not Applicable
Melting Point/range	Not Applicable
Flammability	Not flammable under normal conditions of storage and handling.
Auto ignition temperature	Not Applicable
Explosive limits	Not Applicable
Oxidizing Properties	None
Vapor Pressure	Not Applicable
Relative density	0.6 to 0.8
Solubility in water	Disperses in water.
Solubility in solvent	Not soluble
Partition coefficient	Not Applicable
Viscosity	cps at 70F=20cps
Vapor density	Not Applicable
Evaporation rate	Not Applicable
Conductivity	Not Applicable

SECTION X – STABILITY AND REACTIVITY

Stability: Stable at ambient temperatures and atmospheric pressure. Avoid excessive heat. Refrigerate when not in use.
Conditions to avoid: Hydroscopic; protect from moisture. Must store at 35°F - 39°F or 2° - 3° C.
Incompatibility (Materials to avoid): Strong Acids May Inactivate Cultures
Hazardous Decomposition or Byproducts: Oxides of Carbon & Nitrogen.
Hazardous Polymerization: Will NOT occur

SECTION XI – TOXICOLOGICAL INFORMATION

EXPOSURE LIMITS

Chemical Name(s):	ACGIH (TWA)	OSHA (TWA)
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NONE

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing: Ingestion of large quantities may result in abdominal discomfort including nausea, vomiting, cramps, and diarrhea.

Skin Absorption: Not absorbed through skin.

Inhalation: May cause respiratory tract irritation.

Eye contact: May cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged or repeated contact may cause allergic reactions in hypersensitive individuals,

Other Effects of Overexposure: NONE

Existing Medical Conditions Possibly Aggravated by Exposure: Respiratory allergy (hay fever, asthma) in some people. Individuals hyper allergic to enzymes or other related proteins should not handle.

Carcinogenicity: This product does not contain any ingredient designated by IARC, NTP, ACHIH, or OSHA as a probable human carcinogen. No known significant effects or critical hazards.

SECTION XII – ECOLOGICAL INFORMATION

Environmental Effects: Minimal impact under normal conditions of use and storage. The bacterial cultures are naturally occurring organisms. The product contains naturally occurring materials.

Mobility: Disperses in water

Degradability: Contents are biodegradable

Bioaccumulative potential: None known

Aquatic Toxicity: None Known

SECTION XIII – DISPOSAL INFORMATION

Waste disposal method: No special disposal method. May be sewerred; compatible with all known biological treatment methods. Dispose of in accordance with local, state, and Federal regulations.

Precautions to be taken in Handling and Storing: Must Keep refrigerated at 2-4 C. or 35° - 39° F. temperature when not in use. Avoid direct skin contact.

SECTION XIV – TRANSPORT INFORMATION

D.O.T. Hazard Class: Not Applicable
D.O.T. Label(s): Not Applicable
D.O.T. Shipping Name: (N.O.I) Non Hazardous
UN number- Not Classified
Class- Not Classified
Primary Hazard-- Not Classified
Subsidiary Hazard-- Not Classified
Packing Group - Not Classified
Emergency Action Code - Not Classified
H.I. Number - Not Classified
Marine Pollutant-- Not Classified
Transport Environmental Hazard- Not Classified
Transport Special Precautions – Ship overnight in Insulated container (Do not Freeze)
Proper Shipping name
Water treatment compounds, bacterial culture.

SECTION XV – REGULATORY INFORMATION

TSCA Inventory Status: This product is exempt from on the TSCA inventory.
Transportation Status: DOT: Not regulated.
Reportable Quantity (RQ) under 49 CFR 172. 101 Appendix: Not required.
SARA Title III:
Section 302/304/311/312 Extremely Hazardous Substance List: Not listed.
Section 313 Toxic Chemicals: Not listed.
Reportable Quantity (RQ) under US EPA CERCLA: Not required.
RCRA Hazardous Waste: Not listed.
California Proposition 65 Not listed.

SECTION XVI– OTHER INFORMATION

Product Name: MicroSolv™ 600-L

C.A.S. #

N/A

Supersedes: All previous

Effective Date: 1/2014

National Fire Protection Association
Hazardous Materials Identification System
4=Extreme/Severe 3=High/Serious
2=Moderate 1=Slight 0=Minimum

	NFPA	HMIS
Health	0	0
Fire	0	0
Reactivity	0	0
Special	0	0

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MATERIAL SAFETY DATA SHEET MicroSolv™ 600-L



MicroSolv 600L



Certificate of Analysis

Product MicroSolv 600L

Shipment Date November 30th 2016

Nitrosomonas Bacterial Concentration (Activity)

650/750 mg/l/hr NH₃

Additional QC testing: Analytical methods

Results

ASTM 1604 for E. Coli and fecal coliform

None found

ASTM E2562 for pathogenic pseudomonas aeruginosa

None found

ASTM E1687 for Salmonella and other workplace pathogens

None found

We certify the above given information to be correct at the time of sampling.

Environmental Leverage Inc.®
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